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#### ABSTRACT

The present invention discloses an operation method for a polymer electrolyte fuel cell in an optimum operating condition by regulating the cell by a function represented by a gas flow rate and the difference between a saturated steam pressure and an actual steam pressure, by regulating an in-plane temperature distribution obtained by a cooling water flow direction and by the regulations of a cooling water inlet temperature and a cooling water flow amount; a gas supply amount; a supplied moisture amount; and a current density.

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